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## ECE440: Homework #5

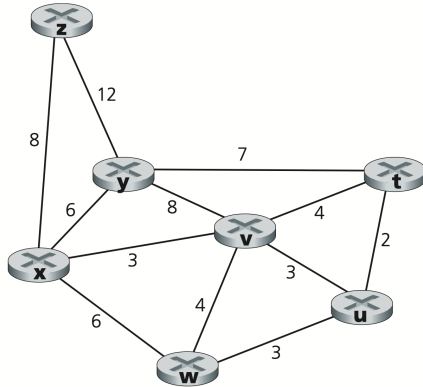
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### 1. Problem P3, Chapter 5 (50%)

Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from  $x$  to all nodes. Show how the algorithm works by computing a table similar to Table 5.1.



Step	N'	D(z),p(z)	D(y),p(y)	D(w),p(w)	D(v),p(v)	D(u),p(u)	D(t),p(t)
0	x	8,x	6,x	6,x	3,x	$\infty$	$\infty$
1	vx	8,x	6,x	6,x	-	6,v	7,v
2	vwx	8,x	6,x	-	-	6,v	7,v
3	vwxy	8,x	-	-	-	6,v	7,v
4	uvwxy	8,x	-	-	-	-	7,v
5	tuvwxy	8,x	-	-	-	-	-
6	tuvwxyz	-	-	-	-	-	-

## 2. Problem P5, Chapter 5 (50%)

Consider the network shown below, and assume that each node initially knows the costs to each of its neighbors. Consider the distance-vector algorithm and show the distance table entries at node  $z$ .

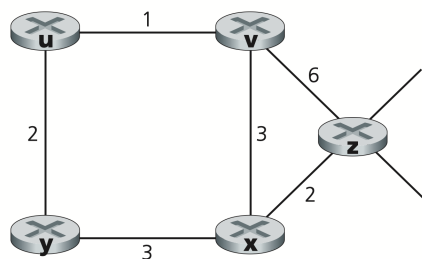


Table 1: Initial Neighbors

		to				
		u	v	x	y	z
from	u	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
	v	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
	x	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
	y	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
	z	$\infty$	6	2	$\infty$	$\infty$

Table 2: After One-hop

		to				
		u	v	x	y	z
from	u	0	1	$\infty$	2	$\infty$
	v	1	0	3	$\infty$	6
	x	$\infty$	3	0	3	2
	y	2	$\infty$	3	0	$\infty$
	z	$\infty$	6	2	$\infty$	0

Table 3: Minimum distance vectors

		to				
		u	v	x	y	z
from	u	0	1	4	2	6
	v	1	0	3	3	5
	x	4	3	0	3	2
	y	2	3	3	0	5
	z	6	5	2	5	0